

## Cube/Small Satellite Antenna Design and Performance Optimization



Completed Technology Project (2011 - 2012)

## Project Introduction

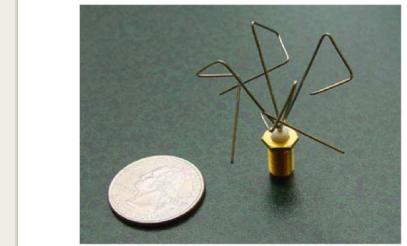
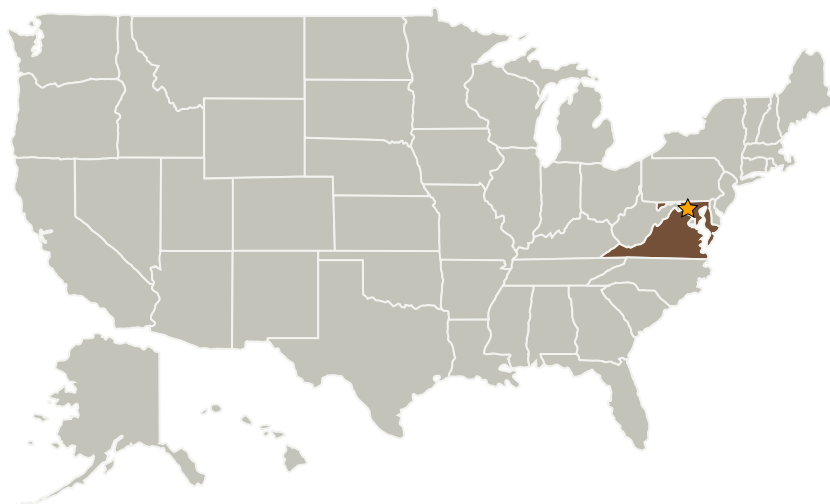
The scope of this IRAD proposal is the research and design of alternatives to standard omni-directional antennas that could better optimize CubeSat/Small satellite performance around typical limitations such as power and physical size/shape. Different antenna designs and configurations will be investigated to obtain better radiation characteristics. Arraying of small antennas will be explored as well as another potential technique to improve antenna coverage and performance.

This IRAD proposal investigates and proposes different small, efficient, low cost, reliable, and robust antenna design concepts with stable electrical and radiation characteristics in harsh space environments for cube/small satellites. Objective 1: Investigate what type of novel antennas have been considered, designed and implemented on previous CubeSat/Small Satellites. Objective 2: Perform some analytical and numerical analysis work to come up with a design skeleton. Objective 3: Running simulations to further optimize proposed antenna designs as well as investigate performance in the presence of physical small satellite structures. Objective 4: Designing a novel CubeSat/Small satellite antenna baseline.

## Anticipated Benefits

N/A

## Primary U.S. Work Locations and Key Partners



Project Image Cube/Small Satellite Antenna Design and Performance Optimization

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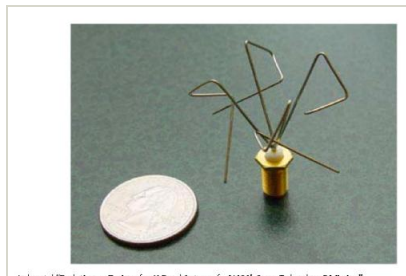


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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Virginia

## Images

**5138.jpg**

Project Image Cube/Small Satellite Antenna Design and Performance Optimization  
(<https://techport.nasa.gov/image/1294>)

**Project Website:**

<http://aetd.gsfc.nasa.gov/>

## Organizational Responsibility

**Responsible Mission Directorate:**

Mission Support Directorate (MSD)

**Lead Center / Facility:**

Goddard Space Flight Center (GSFC)

**Responsible Program:**

Center Independent Research & Development: GSFC IRAD

## Project Management

**Program Manager:**

Peter M Hughes

**Project Manager:**

Wayne R Powell

**Principal Investigator:**

Serhat Altunc

**Co-Investigator:**

Joseph S Obrien

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## Technology Maturity (TRL)

Start: **1**  
Current: **3**  
Estimated End: **3**



## Technology Areas

### Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - └ TX05.2 Radio Frequency
    - └ TX05.2.6 Innovative Antennas